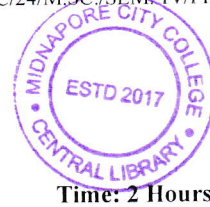


PG (CBCS)
M.SC. Semester- IV Examination, 2026
PHYSICS
 PAPER: PHS 407B
(APPLIED ELECTRONICS-II)



Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.
 Candidates are required to give their answers in their own words as far as practicable.

Applied Analog Electronics-II

GROUP-A

Answer any **TWO** of the following questions: 2×2=4

1. Why TEM mode of propagation is not possible in a wave guide?
2. What is intermediate frequency (IF) and why they are generated in a TV receiver?
3. Find the picture carrier frequency, sound carrier frequency and colour subcarrier frequency for channel number 9 of Indian television transmission system.
4. Write down full forms of PAL and SECAM.

GROUP-B

Answer any **TWO** of the following questions: 2×4=8

5. What do you understand by interlaced scanning? Why is it used in TV transmission system?
6. Draw and Explain block diagram of a black and white television transmitter.
7. Why are color difference signals transmitted instead of transmitting individual color signals? Why green color difference signal i.e. (G-Y) is never used for color signal transmission?
8. Explain the detailed operation of ramp type digital voltmeter with proper block diagram.

GROUP-C

Answer any **ONE** of the following questions: 1×8=8

9. What do you mean by vestigial side band modulation and why is it used in TV picture signal modulation? Derive an expression for the highest modulating frequency in monochromatic 625 lines TV system. Mention the picture IF and sound IF in 625 lines TV system.
10. Discuss the Characteristics of TE and TM wave and also derive cut-off frequency and phase velocity from the propagation constant.

(P.T.O.)

(2)

Applied Digital Electronics-IIGROUP-AAnswer any **TWO** of the following questions:

2×2=4

11. Write down the output of A register after execution of the following program in 8085 microprocessor: XRA A / INR A / ADD A / HLT.
12. Differentiate ASK and FSK.
13. What are the merits of PCM?
14. What is Delta modulation?

GROUP-BAnswer any **TWO** of the following questions:

2×4=8

15. What is sampling theorem? Why f_s should be greater than $2f_m$?
16. Briefly describe the process of Frequency Shift Keying modulation technique.
17. Discuss with example the process of physical address generation of an instruction in 8086 μP .
18. In a single integration DM scheme, the voice signal is sampled at a rate of 64 kHz. The maximum signal amplitude is 1 Volt. Determine the minimum value of step size to avoid slope overload.

GROUP-CAnswer any **ONE** of the following questions:

1×8=8

19. What is quantization error in PCM? How can you reduce the error? Explain with example. An analog voltage in the range 0 to 8 V is divided into 16 equal intervals for conversion to 4-bit digital output. What is the maximum quantization error (in V)?
20. Explain the functions internal architecture of 8085 microprocessors. Why are the program counter and the stack pointer 16-bit registers? Define opcode and operand, and specify the opcode and the operand in the instruction MOV A, B.

